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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,303	10/15/2003	Kentaro Nagoshi	SIW-067	9456

959 7590 01/25/2007
LAHIVE & COCKFIELD, LLP
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BOSTON, MA 02109-2127

EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/688,303

Applicant(s)

NAGOSHI ET AL.

Examiner

Raymond Alejandro

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 6-15 is/are pending in the application.
- 4a) Of the above claim(s) 3,4 and 7-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/30/06 has been entered.

This is in response to the amendment accompanying the abovementioned RCE. The art rejection has not been satisfactorily overcome yet. Refer to the abovementioned amendment for substance of applicant's rebuttal arguments and remarks. Thus, the art rejection still stands for the reasons of record. In addition, a new ground of rejection under section 103 has been added. Therefore, active claims 1 and 6 are newly rejected, as shown hereunder, for the reasons of record:

Election/Restrictions

1. Claims 3-4 and 7-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 05/11/06. (*In the prior office action, the examiner inadvertently omitted withdrawn claims 3-4*).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese publication 2000-208153 (hereinafter referred to as the JP'153).

The present claims are geared toward a separator assembly wherein the disclosed inventive concept comprises the specific diffusion layer and separator being joined (welded).

As to claim 1:

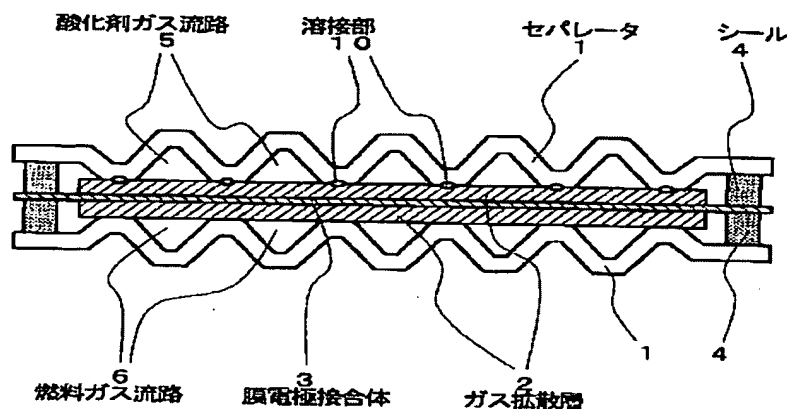
The JP'153 discloses a porous metallic gas diffusion layer for diffusing fuel cell reactants (ABSTRACT/P0007). The gas diffusion layer is made of stainless steel (ABSTRACT).

The JP'153 also discloses a metallic separator which is positioned adjacent to the gas diffusion layer (ABSTRACT/P0005).

Both the gas diffusion layer and the metallic separator are bonded by resistance welding at a welding part 10. *Thus, they are welded together.*

Figure 1 below illustrates the gas diffusion layer 2 and the separator 1 adjacent to each other; the gas flow channels 5 and 6; and the welding parts 10.

【図 1】



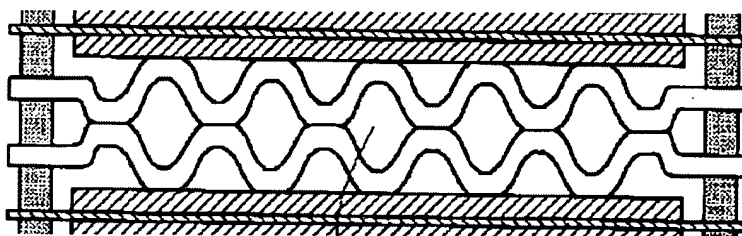
1st Examiner's note: It is noted that the instant claims are being construed as product-by-process claims and that the product itself does not depend on the process of making it. Accordingly, in a product-by-process claim, the patentability of a product does not depend on its method of production. In that, it is further noted that the product in the instant claims is the same as or obvious over the product of the prior art. In this instant case, the method limitations (i.e. the laser welding or by melting, or by irradiation by a laser beam and by solidifying) do not patentably distinguish the product because what is given patentable consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.

As shown above in **Figure 1**, the combination of the corrugated separators 1 and the welding parts 10 allows the formation of reactant passages 5 and 6 (See Figure 1). *Note: the part connecting separator plate 1 and diffusion layer 2 clearly forms partitions in the diffusion layer; consequently, oxidizing gas or fuel pathways are formed. Additionally, welding part 10 formed in the diffusion layer is also part of the partition formed therein.*

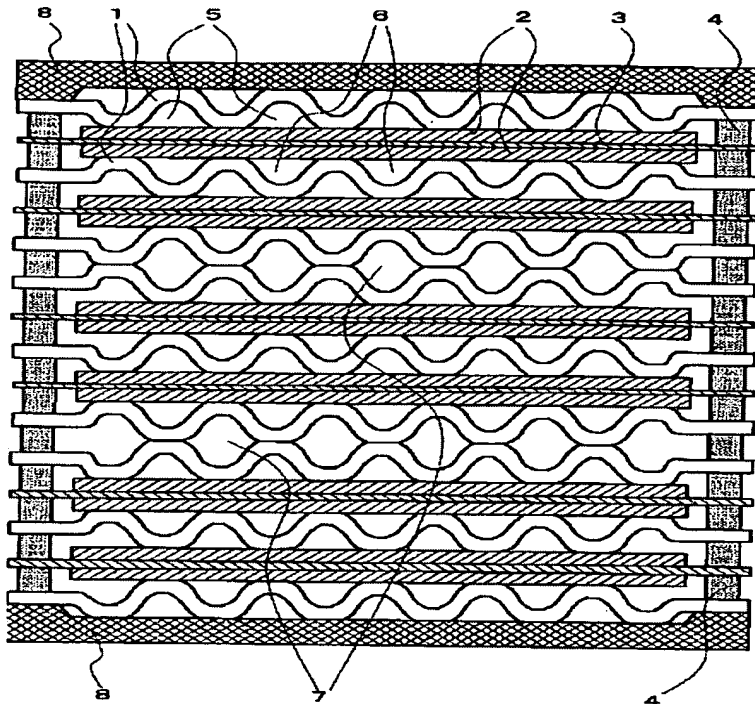
2nd Examiner's note: as to the limitation "the separator being substantially flat", the examiner notes that non-corrugated areas of the disclosed separator 1 are flat. That is to say, each and every segment of the separator 1 (See Figure 1) that is not angled is flat, and thus, it meets the claimed requirement of being "substantially flat" at those specific locations. Note that the examiner is not stating that the entire area or entire perimeter or entire length of the separator is flat per se, but the examiner is stating herein that even though the separator disclosed by the JP'153 is corrugated, such a corrugated separator further comprises non-corrugated areas having a substantially flat shape. Yet further, the examiner contends that the two ends of the disclosed separator meet the requirement of being substantially flat because applicant has not further specified whether the entire separator, or the central area thereof or ends thereof is(are) flat.

As for claim 6:

Figure 4 below of the JP'153 illustrates the inclusion of separator layers forming cooling water passages 7. Note that such separator layers are joined together or bonded to form the cooling water passage structure. Enlarged portion of Figure 4 better illustrates this configuration.



【 図 4 】



Therefore, the claims are anticipated by the JP'153. However, if the claims are not anticipated the claims are obvious as it has been held similar products claimed in product-by-process limitations are obvious *In re Brown* 173 USPQ 685 and *In re Fessman* 180 USPQ 324 (**Refer to MPEP 2113: Product-by-Process Claims**).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication 2000-208153 (hereinafter referred to as the JP'153) in view of Marianowski et al 5342706.

The present claims are geared toward a separator assembly wherein the disclosed inventive concept comprises the specific diffusion layer and separator being joined (welded).

As to claim 1:

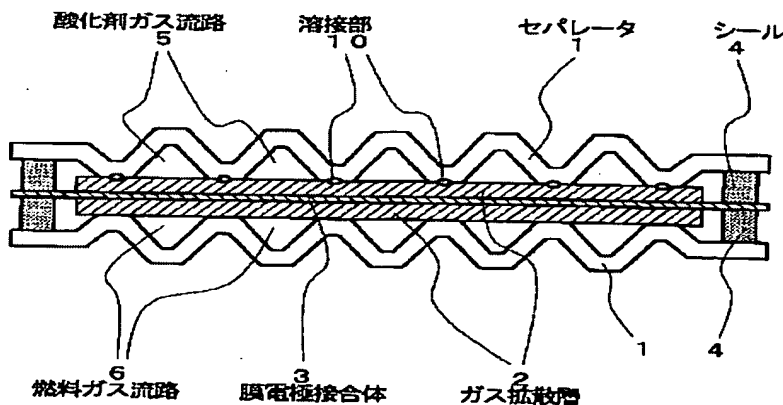
The JP'153 discloses a porous metallic gas diffusion layer for diffusing fuel cell reactants (ABSTRACT/P0007). The gas diffusion layer is made of stainless steel (ABSTRACT).

The JP'153 also discloses a metallic separator which is positioned adjacent to the gas diffusion layer (ABSTRACT/P0005).

Both the gas diffusion layer and the metallic separator are bonded by resistance welding at a welding part 10. *Thus, they are welded together.*

Figure 1 below illustrates the gas diffusion layer 2 and the separator 1 adjacent to each other; the gas flow channels 5 and 6; and the welding parts 10.

【図 1】



1st Examiner's note: *It is noted that the instant claims are being construed as product-by-process claims and that the product itself does not depend on the process of making it. Accordingly, in a product-by-process claim, the patentability of a product does not depend on its method of production. In that, it is further noted that the product in the instant claims is the same as or obvious over the product of the prior art. In this instant case, the method limitations (i.e. the laser welding or by melting, or by irradiation by a laser beam and by solidifying) do not patentably distinguish the product because what is given patentable consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made. In re Brown 173 USPQ 685 and In re Fessman 180 USPQ 324 (Refer to MPEP 2113: Product-by-Process Claims).*

As shown above in **Figure 1**, the combination of the corrugated separators 1 and the welding parts 10 allows the formation of reactant passages 5 and 6 (See Figure 1). *Note: the part connecting separator plate 1 and diffusion layer 2 clearly forms partitions in the diffusion layer; consequently, oxidizing gas or fuel pathways are formed. Additionally, welding part 10 formed in the diffusion layer is also part of the partition formed therein.*

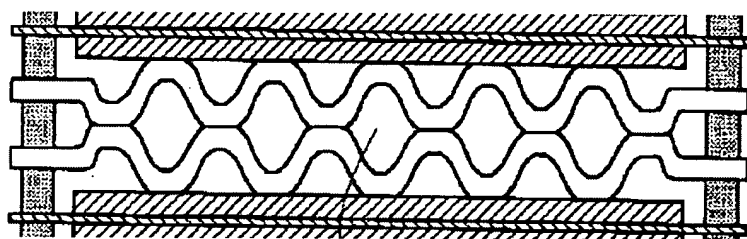
2nd Examiner's note: *as to the limitation "the separator being substantially flat", the examiner notes that non-corrugated areas of the disclosed separator 1 are flat. That is to say, each and every segment of the separator 1 (See Figure 1) that is not angled is flat, and thus, it meets the claimed requirement of being "substantially flat" at those specific locations. Note that the examiner is not stating that the entire area or entire perimeter or entire length of the separator is flat per se, but the examiner is stating herein that even though the separator disclosed by the JP'153 is corrugated, such a corrugated separator further comprises non-*

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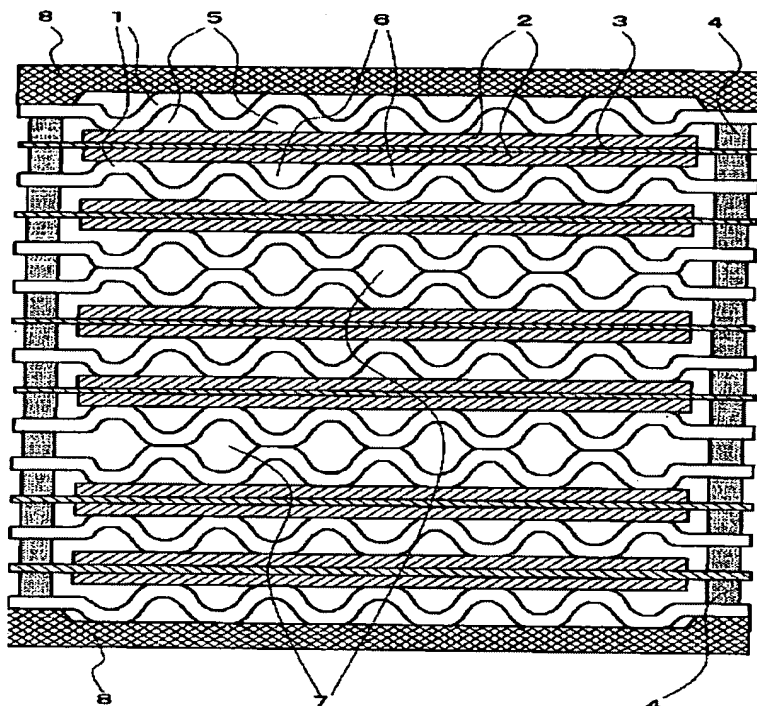
corrugated areas having a substantially flat shape. Yet further, the examiner contends that the two ends of the disclosed separator meet the requirement of being substantially flat because applicant has not further specified whether the entire separator, or the central area thereof or ends thereof is(are) flat.

As for claim 6:

Figure 4 below of the JP'153 illustrates the inclusion of separator layers forming cooling water passages 7. Note that such separator layers are joined together or bonded to form the cooling water passage structure. Enlarged portion of Figure 4 better illustrates this configuration.



【 図 4 】



The JP'153 disclose a separator as seen and described above. Nevertheless, (*assuming arguendo that*) the preceding prior art reference does not expressly disclose the flat separator (*a point not fully conceded by the examiner*).

Marianowski et al disclose separator plates provide the dual function of providing a gas chamber non-reactive separator as well as providing structural strength to the fuel cell as an internal load bearing member (Col 9, line 63 to Col 10 line 6). While it is preferred to use separator having a corrugated and/or dimpled cross-sectional shape in the active area to provide both strength and better gas circulation adjacent the electrodes, the principles of this invention are also applicable to flat separator plates structured to provide peripheral seal areas and to provide seals around internal manifold holes while allowing gas to pass to and from the internal manifolds as required for fuel cell operation (Col 9, line 63 to Col 10 line 6).

In view of the above, it would have been obvious to a person having ordinary skill in the art to replace the corrugated separator plate of the JP'153 with the flat separator plate of Marianowski et al as Marianowski et al disclose that while it is preferred to use separator having a corrugated and/or dimpled cross-sectional shape in the active area to provide both strength and better gas circulation adjacent the electrodes, the principles of this invention are also applicable to flat separator plates structured to provide peripheral seal areas and to provide seals around internal manifold holes while allowing gas to pass to and from the internal manifolds as required for fuel cell operation. Thus, Marianowski et al provide sufficient direction to interchange corrugated separator plates and flat separator plates without affecting or generating major technical, structural or mechanical disadvantages.

7. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication 2000-208153 (hereinafter referred to as the JP'153) in view of Ong et al 5531956.

The present claims are geared toward a separator assembly wherein the disclosed inventive concept comprises the specific diffusion layer and separator being joined (welded).

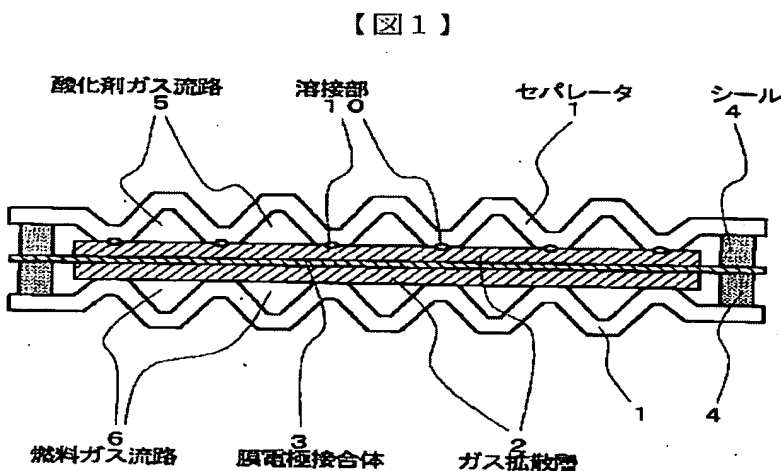
As to claim 1:

The JP'153 discloses a porous metallic gas diffusion layer for diffusing fuel cell reactants (ABSTRACT/P0007). The gas diffusion layer is made of stainless steel (ABSTRACT).

The JP'153 also discloses a metallic separator which is positioned adjacent to the gas diffusion layer (ABSTRACT/P0005).

Both the gas diffusion layer and the metallic separator are bonded by resistance welding at a welding part 10. Thus, they are welded together.

Figure 1 below illustrates the gas diffusion layer 2 and the separator 1 adjacent to each other; the gas flow channels 5 and 6; and the welding parts 10.



1st Examiner's note: It is noted that the instant claims are being construed as product-by-process claims and that the product itself does not depend on the process of making it. Accordingly, in a product-by-process claim, the patentability of a product does not depend on its method of production. In that, it is further noted that the product in the instant claims is the same as or obvious over the product of the prior art. In this instant case, the method limitations (i.e. the laser welding or by melting, or by irradiation by a laser beam and by solidifying) do not patentably distinguish the product because what is given patentable consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made. In re Brown 173 USPQ 685 and In re Fessman 180 USPQ 324 (Refer to MPEP 2113: Product-by-Process Claims).

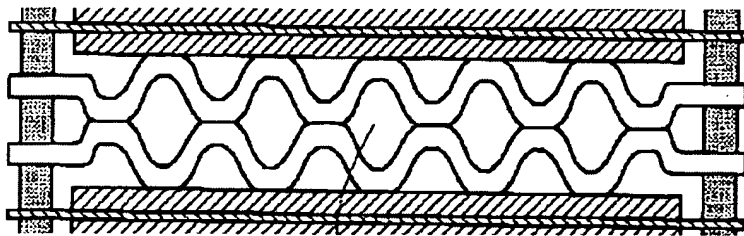
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As shown above in **Figure 1**, the combination of the corrugated separators 1 and the welding parts 10 allows the formation of reactant passages 5 and 6 (See Figure 1). *Note: the part connecting separator plate 1 and diffusion layer 2 clearly forms partitions in the diffusion layer; consequently, oxidizing gas or fuel pathways are formed. Additionally, welding part 10 formed in the diffusion layer is also part of the partition formed therein.*

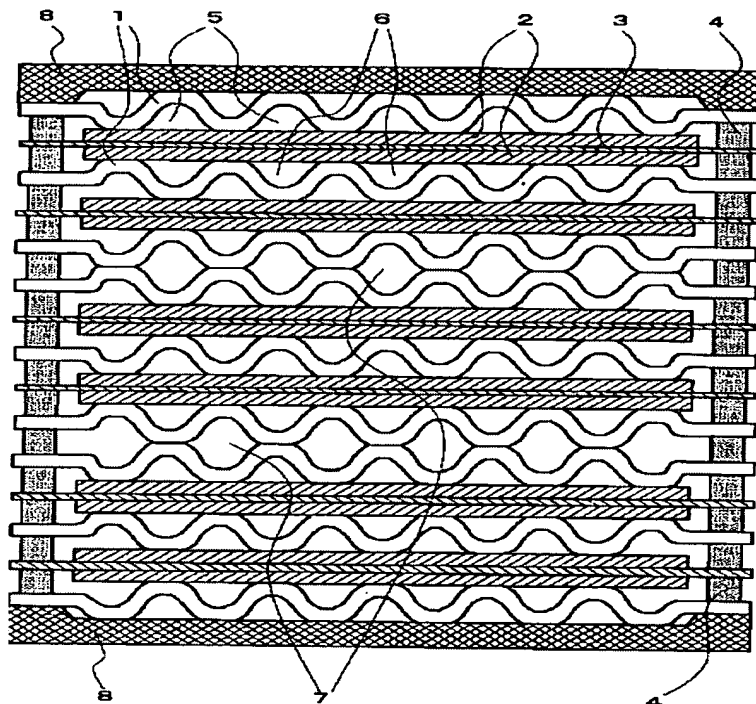
2nd Examiner's note: *as to the limitation "the separator being substantially flat", the examiner notes that non-corrugated areas of the disclosed separator 1 are flat. That is to say, each and every segment of the separator 1 (See Figure 1) that is not angled is flat, and thus, it meets the claimed requirement of being "substantially flat" at those specific locations. Note that the examiner is not stating that the entire area or entire perimeter or entire length of the separator is flat per se, but the examiner is stating herein that even though the separator disclosed by the JP'153 is corrugated, such a corrugated separator further comprises non-corrugated areas having a substantially flat shape. Yet further, the examiner contends that the two ends of the disclosed separator meet the requirement of being substantially flat because applicant has not further specified whether the entire separator, or the central area thereof or ends thereof is(are) flat.*

As for claim 6:

Figure 4 below of the JP'153 illustrates the inclusion of separator layers forming cooling water passages 7. *Note that such separator layers are joined together or bonded to form the cooling water passage structure. Enlarged portion of Figure 4 better illustrates this configuration.*



【 図 4 】



The JP'153 disclose a separator as seen and described above. Nevertheless, (*assuming arguendo that*) the preceding prior art reference does not expressly disclose the flat separator (*a point not fully conceded by the examiner*).

Ong et al disclose the use of flat separator plates in fuel cells (COL 1, lines 25-29). In view of the above, it would have been obvious to a person having ordinary skill in the art to replace the corrugated separator plate of the JP'153 with the flat separator plate of Ong et al as Ong et al disclose that the overall cost of a fuel cell stack can be greatly diminished if flat separator plates can be used in place of corrugated separator plates. Thus, Ong et al directly

suggest the use of flat separator plates for purposes of cost reduction so as to avoid the use of complex and costly corrugated plates. *Note that other than being complex and of high cost, Ong et al do not disclose any other technical disadvantage to using corrugated plates. Therefore, Ong et al's preference of flat separator plates over corrugated separator plates is based on cost reduction rather than a technical disadvantage. As such, Ong et al does not teach away from using corrugated separator plates due to mechanical, structural or technical drawbacks.*

Response to Arguments

8. Applicant's arguments with respect to claims 1 and 6 have been considered but are moot in view of the new ground(s) of rejection. See items 6-7 above.

9. All of the arguments raised by the Applicant in the amendment dated 11/30/06 have been fully considered but they are not persuasive.

10. Applicant has contended that *"JP 2002-208153 does not disclose or teach that the separator is substantially flat, and the separator and the diffusion layer are welded together"*.

The examiner respectfully disagrees with applicant's contention. As to the limitation "the separator being substantially flat", the examiner notes that non-corrugated areas of the disclosed separator 1 are flat. That is to say, each and every segment of the separator 1 (See Figure 1) that is not angled is flat, and thus, it meets the claimed requirement of being "substantially flat" at those specific locations. Note that the examiner is not stating that the entire area or entire perimeter or entire length of the separator is flat per se, but the examiner is stating herein that even though the separator disclosed by the JP'153 is corrugated, such a corrugated separator further comprises non-corrugated areas having a substantially flat shape. Yet further, the

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examiner contends that the two ends of the disclosed separator meet the requirement of being substantially flat because applicant has not further specified whether the entire separator, or the central area thereof or ends thereof is(are) flat.

As for the limitation “welded”, notice please that both the gas diffusion layer and the metallic separator are bonded by resistance welding at a welding part 10. Thus, they are welded together. With respect to the specific welding technique (i.e. “laser welding”), the examiner has treated this limitation as a product-by-process limitation (See *1st Examiner Note* in the rejection above), and among other things, applicant bears the burden to demonstrate that such a claimed technique produces unexpected results and/or a different structure. So far, no such evidence has been provided to rebut the prima-facie case of obviousness/anticipation based upon a product-by-process claim imposed by the examiner.

11. Applicant has also contended that “*JP 2002-208153 does not disclose or teach that flow passage partitions are formed in the diffusion layer so as to define a flow passage for the fuel or oxidizer in the diffusion layer*”. Again, this contention is respectfully but strenuously disagreed with. As previously explained, as seen above in **Figure 1**, the combination of the corrugated separators 1 and the welding parts 10 allows the formation of reactant passages 5 and 6 (See Figure 1). Note that the part connecting separator plate 1 and diffusion layer 2 clearly forms partitions in the diffusion layer; consequently, oxidizing gas or fuel pathways are formed. Additionally, welding part 10 formed in the diffusion layer is also part of the partition formed therein.

12. Finally, applicant has contended that “*JP 200-208153 does not disclose that a cooling layer and a separator are welded together*”. However, **Figure 4** above depicts the inclusion of

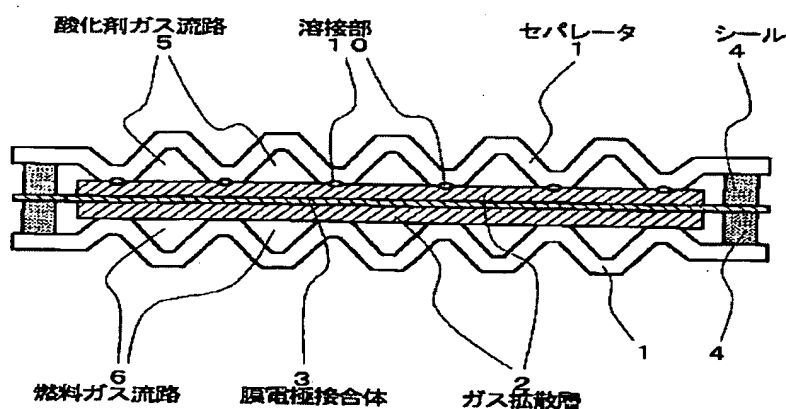
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separator layers forming cooling water passages 7. *Note that such separator layers are joined together or bonded to form the cooling water passage structure.*

13. The following responses to applicant's arguments were set forth in a prior office action, and thus, are again presented for the reasons of record.

14. Turning now to applicant's discussion on the JP'153. In response to applicant's argument about the apparent lack of "flow passages partitions formed on the diffusion layer so as to define a flow passage for the fuel or oxidizer in the diffusion layer" in the JP'153, the examiner states that as shown above in **Figure 1**, the combination of the corrugated separators 1 and gas diffusion layers 2, and/or the welding parts 10 allows the formation of reactant passages 5 and 6 (See Figure 1). It is strenuously noted that the part connecting separator plate 1 and diffusion layer 2 clearly forms partitions in the diffusion layer; consequently, oxidizing gas or fuel passages 5 and 6 are formed. Additionally, welding part 10 formed in the diffusion layer is also part of the partition formed therein, and such a welding part can be taken as a partition by itself, or collectively with features 1 (separators) and 3 (gas diffusion layers). Clearly, **Figure 1** shows partitions forming both fuel and oxidizer gas flow passages.

【図 1】



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15. In following applicant's arguments, it is noted that it has been argued that the JP'153 "*discloses that adjacent separators form a coolant passage. JP'153, however, does not disclose that a cooling layer and a separator are welded together...*". The examiner respectfully but strenuously disagrees with applicant's full characterization of the prior art. In partial agreement with applicant's assertion, the JP'153 discloses adjacent separators forming a coolant passage (as admitted by the applicant, see the 08/17/06 amendment paragraph bridging pages 8-9). However, the examiner has construed one of the adjacent separators as "*the claimed cooling layer*" as it provides essentially the same structure (i.e. cooling layer welded with the separator) as well as the same functionality (i.e. for allowing the passing of coolant) as "*the claimed cooling layer*". It is just a matter of semantic labeling, one in which applicant prefers to call or name it "*the cooling layer*", and the other (the JP'153) designates it "*the adjacent separator*".

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro
Primary Examiner
Art Unit 1745



RAYMOND ALEJANDRO
PRIMARY EXAMINER